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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,431	08/31/2005	Robin John Batterham	4623-045789	2821

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EXAMINER	
MCNELIS, KATHLEEN A	
ART UNIT	**PAPER NUMBER**
1742	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/516,431	BATTERHAM ET AL.	
	Examiner	Art Unit	
	Kathleen A. McNelis	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claims Status

Claims 1-27 remain for examination wherein claims 1-5, 7, 11, 12, 16-21 and 23 are amended.

Examiner's Comments

The terms "high energy" and "short duration" have been interpreted in terms of the specification as meaning respectively higher than 1 kW (specification p. 5) and less than 1 second (specification p. 6).

DETAILED ACTION

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 11, 20 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by CA 2277383 (CA '383).

With respect to claims 1, 2 and 20, CA '383 discloses a method of subjecting ore to thermal shock to cause microfracturing of the material without significant change in the chemical structure so that the ore may then be processed by conventional means (abstract) and the thermal shock is provided by microwave energy (p. 1 lines 24-25). In the absence of further structural limitations, examiner contends that "without significant change in the chemical structure" is the same as "without significantly altering the mineralogy" (claim 1), "without catastrophic destruction of the ore particles" (claim 2) and without "catastrophic break down of the particles" (claim 20). "Microfracturing" is the same as "causing structural alteration" (claims 1 and 20).

With respect to claims 11 and 27, CA '383 discloses recovery of metals, e.g. gold from ore (pp. 2-3).

Claims 1-3, 5, 6, 11, 12, 16, 18, 20-22 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 92/018249 (WO '249).

With respect to claims 1-3, 5, 11, 20, 21 and 27, WO '249 discloses a process for recovering gold from sulfide bearing ores (p. 1 lines 4-22) where the ore is crushed and screened (p. 2 lines 20-24) and exposed to pulses of microwave energy (p. 2 lines 3-8). WO '249 discloses that X-ray diffraction (XRD) revealed there was no significant difference between crushed ore samples before and after microwave energy processing (p. 9 lines 18-23) and teaches controlling energy to prevent fusing or oxidation (pp. 9-11), which in the absence of further structural limitations, examiner contends is the same as "without significantly altering the mineralogy" (claim 1), "without catastrophic destruction of the ore particles" (claims 2) and without "catastrophic break down of the particles" (claim 20). WO '249 discloses that XRD indicated that conductive constituents were all affected to a minor degree by microwave processing (p. 9 lines 23-30), and that the microwave energy causes "mechanical breakdown" (p. 3 lines 21-25) therefore structural alteration of the ore particles occurred as in instant claims 1, 20, 21 and 27.

With respect to claims 5, 6 and 22, WO '249 discloses exposing the ore to 1300 W of pulsed microwave energy (p. 10 line 27 – p. 1 line 1), which is pulse of high energy as in claims 5, 6 and 22.

With respect to claims 11 and 27, WO '249 discloses recovering gold from ore (abstract).

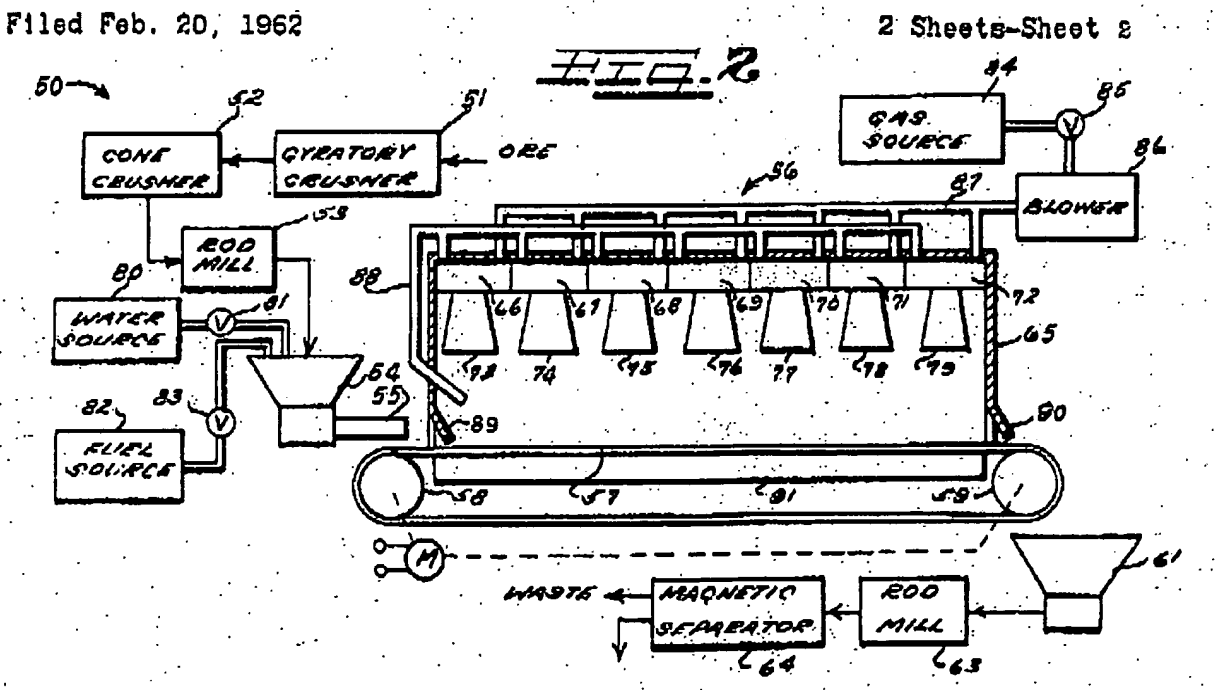
With respect to claim 12, WO '249 discloses treatment of gold in sulfide ore (p. 1 lines 7-21 and p. 9 line 31 – p. 10 line 26).

With respect to claim 16, WO '249 discloses treatment of ore containing pyrite (p. 5 lines 1-5 and p. 9 lines 8-15).

With respect to claim 18, WO '249 discloses crushing to a size of less than 10 mm (p. 12 lines 1-30), which is within the range of 15 cm or less.

Claims 1, 2, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Connell (U.S. Pat. No. 3,261,959)[1].

With respect to claims 1, 2 and 20, Connell discloses a method for reductive treatment of iron bearing ores with microwaves where hematite is reduced, but energy levels are controlled to prevent sintering of materials within the ores, which would make subsequent refining more difficult (col. 1 lines 1-40). Since sintering is prevented, and in the absence of further definition or structural limitations, examiner contends is the same as "without significantly altering the mineralogy" (claim 1), "without catastrophic destruction of the ore particles" (claim 2) and without "catastrophic break down of the particles" (claim 20). Since hematite is reduced, "structural alteration" has occurred.



With respect to claim 19, Connell discloses a modified system (Fig. 2) where ore is microwave treated on a conveyor belt (57) (col. 3 lines 28-69).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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[1] The name L.H. Connell et al. appears on the face of the patent, however the patent is listed under the name Lowell A. Moe on the PTO-892 form.

Claims 4 and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or WO 92/018249 (WO '249) or Connell (U.S. Pat. No. 3,261,959) in view of Haque (1999).

CA '383 or WO '249 or Connell are applied as discussed above regarding claim 1.

WO '249 is applied as discussed above regarding claim 12.

CA '383 or WO '249 or Connell does not disclose screening to remove fines from the ore particles (claim 4).

CA '383 or Connell dose not disclose sulfide ores as in claim 12.

CA '383 or WO '249 or Connell does not disclose copper (claim 13), nickel (claim 14) or uranium (claim 15).

With respect to claim 4, Haque (1999) reports a review of Microwave-assisted mineral treatment tests (abstract), and reports that particle size is an important factor in heating ores, and that depending on the type of ore smaller particles will either heat faster or slower than larger, e.g. for magnetite coarser particles heat faster (paragraph bridging pp. 11 and 12). Particle size is therefore recognized in the art as a result effective variable and would have been optimized in the process of CA '383 or WO '249 or Connell as a matter of routine investigation by one of ordinary skill in the art at the time the invention was made, since Hague (1999) teaches that size affects heating rates (see M.P.E.P 2144.05, II, B).

With respect to claims 12-15, Haque (1999) discloses results of studies of sulfidic ores including chalcopyrite (table 6, p.9) and pitchblende containing uranium (Table 5, p. 8) which indicate that both heat readily from microwave exposure, therefore one of ordinary skill in the art would be motivated to treat chalcopyrite or pitchblende ores containing uranium in the process of CA '383 or WO '249 or Connell since Haque (1999) teaches that both ores are readily heated by

microwaves, and heating is desired in CA '383 or WO '249 or Connell. Further, since Haque (1999) teaches that most sulfide ores tested heated well (p. 11, 1st paragraph) one of ordinary skill in the art would have reasonable expectation of success in treating nickel sulfide ore in the process of CA '383 or WO '249 or Connell since the ability to heat of the ore by microwave energy is desired.

Claims 6, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or Connell (U.S. Pat. No. 3,261,959) in view of Flinn et al. (U.S. PG Pub. 2003/0029944).

CA '383 or Connell is applied as discussed above regarding claim 1.

CA '383 or Connell do not disclose pulsing the microwave energy.

Flinn et al. discloses a method for recovering ores assisted by microwave energy (abstract) and teaches that pulsing the microwave energy allows the ore to heat and cool which increases stresses and/or fracturing of the ores and facilitates increased mineral recovery (paragraph 0029). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use pulsing as taught by Flinn et al. in the process of CA '383 or Connell to increase stresses and/or fracturing of the ores and facilitate increased mineral recovery as taught by Flinn et al. and desired by CA '383 or Connell. Flinn et al. discloses a power level of about 2 to 30 kW (paragraph 0029) which is high energy.

Claims 6, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or Connell (U.S. Pat. No. 3,261,959) in view of Salsman et al. (1995).

CA '383 or Connell is applied as discussed above regarding claims 1 and 5.

CA '383 or Connell do not disclose pulsing the microwave energy.

Salsman et al. (1995) discloses the results of a study using short-pulse microwave energy to comminute sulfide ores (abstract). Salsman et al. teaches that continuous microwave energy has been applied to ores to produce fracture, creating enough heat to cause fracture by this method consumes large quantities of energy (p. 44, 1st paragraph). Salsman et al. teaches that short pulse microwave application creates large localized thermal stresses weakening brain boundries and/or inducing microcracking using les energy (p. 44 2nd and 3rd paragraphs and p. 53 conclusions). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use short-pulse microwave energy as taught by Salsman et al. in the processes of CA '383 or Connell for energy savings as taught by Salsman et al. (1995). Salsman et al. (1995) discloses the use of up to 100 kW (p. 46 1st paragraph), which overlaps the claimed range of "high energy" (i.e. > 1 kW).

Claims 7, 8, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 92/018249 (WO '249).

WO '249 discloses exposing the particles to pulse of energy of 1 to 30 seconds duration (p. 2 lines 3-8), which overlaps the claimed range of less than 1 second. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a pulse rate of 1 second, since WO '249 teaches equal utility over the range of 1 to 30 seconds.

Claims 7-10 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or Connell (U.S. Pat. No. 3,261,959) in view of Flinn et al. (U.S. PG Pub. 2003/0029944) as applied to claims 6 and 21 and further in view of Goldberger et al. (U.S. Pat. No. 4,313,573).

CA '383 or Connell in view of Flinn et al. is applied as discussed above regarding claims 6, 21 and 22.

CA '383 or Connell in view of Flinn et al. do not disclose the duration of the pulse energy.

Goldberger et al. discloses a method for separating mineral grains from ores (abstract) where a first step involves creation of microcracking by electric applied a pulsing on the range of 10^{-3} to 10^{-7} seconds to create shock waves within the ore leading to microcracking (col. 2 lines 13-26). This indicates that the pulse cycle is a result effective variable, which would be optimized as a matter of routine investigation by one of ordinary skill in the art in the process of CA '383 or Connell in view of Flinn et al. and lacking evidence of the criticality of the ranges would be prima facie obvious (see M.P.E.P 2144.05, II, B).

Claims 7-10 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or Connell (U.S. Pat. No. 3,261,959) in view of Salsman et al. (1995) as applied to claims 6, 21 and 22 and further in view of Goldberger et al. (U.S. Pat. No. 4,313,573).

CA '383 or Connell in view or Salsman et al. (1995) is applied as discussed above regarding claims 6, 21 and 22.

CA '383 or Connell in view of Salsman et al. (1995) do not disclose the duration of the pulse energy.

Goldberger et al. discloses a method for separating mineral grains from ores (abstract) where a first step involves creation of microcracking by electric applied a pulsing on the range of 10^{-3} to 10^{-7} seconds to create shock waves within the ore leading to microcracking (col. 2 lines 13-26). This indicates that the pulse cycle is a result effective variable, which would be optimized as a matter of routine investigation by one of ordinary skill in the art in the process of CA '383 or Connell in view of Salsman et al. (1995) and lacking evidence of the criticality of the ranges would be prima facie obvious (see M.P.E.P 2144.05, II, B).

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or WO 92/018249 (WO '249) or Connell (U.S. Pat. No. 3,261,959) in view of Kruesi et al. (U.S. Pat. No. 4,324,582).

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or WO 92/018249 (WO '249) or Connell (U.S. Pat. No. 3,261,959) in view of Beckmann (U.S. Pat. No. 6,592,644).

CA '383 or WO '249 or Connell is applied as discussed above regarding claim 1.

WO '249 is applied as discussed above regarding claim 12.

CA '383 or Connell dose not disclose sulfide ores as in claim 12.

CA '383 or WO '249 or Connell does not disclose copper (claim 13) or nickel (claim 14).

Kruesi et al. discloses a method for recovering copper from sulfidic ores by use of microwave energy to make the copper more readily recoverable (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to recover copper from sulfur bearing ores as taught by Kruesi et al in the process of CA '383 or WO '249 or Connell since Kruesi et al. discloses that copper can be recovered from a substantially similar method.

Beckmann discloses a method for extracting metals from copper sulfide ores (abstract) including chalcopyrite which are treated (claim 1) with microwave irradiation (claim 8) and nickel is also extracted (claim 8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to process nickel and copper bearing sulfidic ores as taught by Beckmann in the process of CA '383 or WO '249 or Connell since Beckmann teaches that nickel and copper can be recovered by a substantially similar process.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or WO 92/018249 (WO '249) or Connell (U.S. Pat. No. 3,261,959) in view of GB 2 198 242 (GB '242).

CA '383 or WO '249 or Connell is applied as discussed above regarding claim 1.

CA '383 or WO '249 or Connell does not disclose use of the process with diamond bearing ore.

GB '242 discloses a method of sorting ore particles, including kimberlite (i.e. diamond bearing) based on attenuation of microwave radiation (abstract). GB '242 teaches that kimberlite ore is strongly attenuating (i.e. absorbs energy) (p. 6); therefore one of ordinary skill in the art would have reasonable expectation of success in treating diamond bearing ore such as kimberlite in the process of CA '383 or WO '249 or Connell, since the absorption of energy by the ore (i.e. heating) is desired.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2277383 (CA '383) or WO 92/018249 (WO '249) in view of Connell (U.S. Pat. No. 3,261,959) or Haque (1999).

CA '383 or WO '249 is applied as discussed above regarding claim 1.

CA '383 or WO '249 does not disclose microwave treatment on a conveyor.

Connell et al. discloses a microwave treatment system for ores while traveling on an enclosed conveyor belt which applies uniform application of microwave energy to the ores on the belt (col. 3 lines 28-64). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the conveyor system of Connell et al. to process ores in CA '383 or WO '249 since Connell discloses uniform treatment of ores in this system.

Haque (1999) discloses that microwave heating is performed either in batch or continuous, and that continuous systems are equipped with conveyor type belts to move the material through the oven for heating (pp. 4 and 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the conveyor belt system of Haque (1999) in the process of CA '383 or WO '249 to provide a continuous process as taught by Haque (1999).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571 272 3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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04/14/2007

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